City of Norfolk
Department of Utilities

February 18, 2015

RE: Addendum No.1 – Lake Prince Raw Water Pumping Station Flood Mitigation and Miscellaneous Improvements

To whom it may concern:

Attached please find a copy of the above referenced Addendum. As indicated in the Project Manual, the Bid shall contain an acknowledgment of receipt of this Addendum.

Bid opening remains on Tuesday, February 24, 2015, 3:00 p.m. at 400 Granby St., Norfolk, VA.

Your cooperation is appreciated.

Sincerely,

Christopher J. Krus, PE
Assistant City Engineer - Utilities

Attachments:
Addendum (5 pages, including this Page)
Pre-bid Meeting Sign-in Sheet (2 pages)
Revised Specifications Pages: 102-13, 103-7, 103-23, 01106-1, and 15110-3 (5 pages)
Revised Plan Sheets: E-5, E-6, E-7, E-9, I-2, I-3, I-4 and I-5 (8 pages)

ADDENDUM NO.1

Lake Prince Raw Water Pumping Station
Flood Mitigation and Miscellaneous Improvements
CITY OF NORFOLK
DEPARTMENT OF UTILITIES

This addendum forms a part of the contract documents and clarifies the documents as stated herein. This addendum must be acknowledged in the space provided in the proposal. Failure to acknowledge may subject the Bidder to disqualification.

Except as may be otherwise described, bidding requirements, materials, and workmanship for the work described herein shall conform to all requirements of the original Contract Documents. The following Addendum to the drawings and specifications is made a part of the project, and takes precedence over the section of the specifications in part, as originally written and over the drawings, in part, as originally drawn and/or written.

This Addendum consists of 20 pages, including the Cover Sheet, Addendum and Attachments.

Pre-bid Meeting Minutes:

A non-mandatory pre-bid meeting was held at the Western Brach Pumping Station conference room on February 3, 2015.

1. A copy of the sign-in sheet is attached.

2. A brief overview of the project was provided.

3. Written comments/questions are due not later than (February 16, 4:00 pm) and shall be emailed to: christopher.krus@norfolk.gov .

4. It was anticipated that the issuance of Addendum No. 1 would be on February 18, 2015. This Addendum is expected to consist of the attendance sheet, minutes, any submitted written questions and answers, questions and answers from the pre-bid meeting, and revised Electrical and I&C drawings.

5. Bids will be accepted until February 24, 2015 at 3:00 pm, after which time they will be publicly opened and read aloud. No bids will be accepted after this time.

6. Bidders were reminded to read the Project Manual carefully. A few items were brought to their attention:

a. 250 days to Substantial Completion and 280 days to Final Completion. (See Item 1 of the Changes to the Specifications below)
b. Liquidated damages: $1,000 for Substantial Completion and $500 for Final Completion, and if Substantial Completion is not reached by the Final Completion date, the Liquidated Damages will run concurrent for a total of $1500 per day until Substantial Completion is reached.
c. It was clarified that Section 01650, Facility Start-up, is included in the Specifications (begins on page 185 of the Project Manual pdf).

7. It was indicated that the site area around the compressor building on Girls Scout Road will be available for the contractor's onsite laydown yard.

8. The following specific items associated with the Project were discussed:

   a. One complete facility shutdown shall be allowed during the low flow season commencing on November 1st and ending before March 1st of the following year. It was anticipated that the facility shutdown period will be re-assessed in this Addendum. (See Item 2 of the Changes to the Specifications below).
   b. Qualification requirements in Section 110 were pointed out.
   c. Lump sum project
   d. Pumps and electrical equipment factory testing are to be witnessed by two City appointed representatives. All associated costs shall be included in lump sum Bid price. One witness may be coming from Baltimore, MD.

9. Attendees were urged to visit the Project Site and a visit to the Project site was held after the pre-bid meeting.

10. Attendees were allowed to schedule additional site visits no later than 3:00 pm on Wednesday, February 11, 2015 by contacting Howard Luck at (757) 539-9281.

Response to questions at Pre-bid Meeting:

1. Does the finish paint for the equipment in contact with the raw water need to comply with the NSF 61 requirements?
   Answer: Yes. Bid specifications Section 11214, paragraph 2.05 and Section 15110, paragraph 2.02.G, are stating this requirement for the vertical turbine pump and the control valve, respectively. Finished surfaces not to be painted include aluminum, stainless steel, bronze, brass, copper, and other similarly finished materials.

Response to questions sent in writing:

1. Division 05120 specification for structural steel states that the steel fabricator and erector are to be AISC certified. This certification has become a boiler plate specification, and applies the fabrication of steel for the erection of buildings. This certification eliminates many

smaller steel fabrication shops from submitting a price. The project is not erecting a building. The steel involved in this project is for a platform, ladders, grating and rails. Please change the specification to read "shall be fabricated and erected in accordance with AISC standards". This would open up the bidding to many more potential bidders, thus offering the City of Norfolk best pricing available.
Answer: The specification and AISC certification requirement will not be changed.

2. Can Fairbanks Morse and Weir Floway be named in the Addendum as an approved equal as an alternate to the Layne Pump specified in the contract documents?
Answer: ***Subject to compliance with the Specifications and performance requirements, these manufacturers are acceptable.***

3. Does the factory testing require the use of the jobsite motor or can the manufacturer use a factory calibrated driver?
Answer: The use of a factory calibrated driver of the same specified horsepower will be acceptable.

4. What would be the allowable tolerance margin for the testing results of the pumps?
Answer: Pump test acceptance tolerance grade will be 1E at the conditions points shown on the Drawings, as specified in Specifications Section 11214, paragraph 2.01.A.

5. Will the testing be witnessed by the engineer /owner or will a certified non-witnessed test be satisfactory?
Answer: Certified non-witnessed testing will not be acceptable for the pumps. Factory testing for the pumps will be witnessed by two owner-designated inspectors. The Contractor shall include costs for travel, meals, lodging, and car rental for two owner-designated inspectors. Factory pump test reports, including performance test, hydrostatic test, mechanical test (vibration, bearings temperature, and seals leakage) shall be certified by a licensed professional engineer provided by the manufacturer.

Factory testing for the motors will be non-witnessed. Factory motor test reports certified by a licensed professional engineer shall be submitted including routine or short commercial test (NEMA MG1 – 12.55), sound test, speed torque test and bearing temperature test.

6. Is the use of divers necessary to inspect the 18,000 LF of fiber optic cable called for on this job?
Answer: Bid specification section 13431 does not require the use of divers for the fiber optic cable acceptance inspection.

Changes to the Specifications:

1. Replace substantial completion from 250 to **490** calendar days and final completion from 280 to **520** calendar days on pages 102-13, 103-7 and 103-23 of the Project Manual. (See attached).

2. Replace the scheduled station shutdown period on specifications Section 01106, paragraph 1.01.A from "November 1 through February 29" to "July 6, 2016 through October 26, 2016". (See attached.)
3. Specifications Section 15110 – Pumps Control Valves. On page 15110-3, 2.03 add paragraph F stating the following "The limit switch shall be DPDT type". (See attached).

Changes to the Drawings:

1. Plan Sheets E-7, E-9, I-2, I-3, I-4 and I-5 shall be replaced with revised Plan Sheets E-7, E-9, I-2, I-3, I-4 and I-5 included herein.

Attachments

END OF ADDENDUM

SHEET 1 of 2

DEPARTMENT OF UTILITIES
CITY OF NORFOLK, VIRGINIA

Lake Prince Raw Water Pumping Station Flood Mitigation and Miscellaneous Improvements
Pre-Bid Meeting Sign-In Sheet
Date: February 3, 2015 - **Time:** 10:00 AM

NAME	FIRM	PHONE	FAX	EMAIL
TERRY LEGG	WRA	(757) 497-2925	(757) 497-2928	tlegg@wrallp.com
FRANKIE BRIDGEMAN	T.A. Sheets Co.	757 627 3000	757 624-3550	FRANKIE@TASheetsInc.com
HARVEY HARRIS	SYDNOR HYDRO	757-508-4800	757-238-2311	h.harris@charter.net
GRADY PHILLIPS	BEST REPAIR CO. INC.	757-622-4752	757-625-3206	GRADY.PHILLIPS@BESTREPAIR.NET
BEN WATKINS	BEST REPAIR CO INC.	757.622-4752	757-625-3206	ben.watkins@bestrepair.net
MICHAEL CLARK	MEB G.C	757-487-5858	757-966-1392	mclark@mebgc.com
THOMAS WARNER	PUMP ENGINEERING	757 487-7988	757-485-9845	TWARNER@SUBSURFACETECH.COM
John Midgett	City of Norfolk	757 439-8649		john.midgett@norfolk.gov
Kevin Alvarado	WRA	757-599-5101	757-599-5320	kalvarado@wrallp.com

SHEET 2 OF 2

DEPARTMENT OF UTILITIES
CITY OF NORFOLK, VIRGINIA

Lake Prince Raw Water Pumping Station Flood Mitigation and Miscellaneous Improvements
Pre-Bid Meeting Sign-In Sheet
Date: February 3, 2015 - **Time:** 10:00 AM

NAME	FIRM	PHONE	FAX	EMAIL
PADRAIC GRAY	WRA	443 224 1619		pgray@wrallp.com
Jack Warren	WRA	443.224.1670	—	Rwarren@WRALLP.COM
LES THORPE	Commonwealth Engineering Sales	804-363-0307		les@commengsales.com
Pete Palmer	Carbolite	757-687-9640		PPalmer@Carbolite.com
Bob Hyland	HD Supply	757-424-4604		bob.hyland@hdsupply.com
DAVID QUIDLEY	PETERS + WHITE	757-487-1000		estimating@pwva.net
John Kenny	Peters & White	757-487-1000		estimating@pwva.net
Jim Farrell	Ferland Electric	757-424-0304		jim.FARRELL@ferland-elec.com
Bob Halpin	English Construction	434-845-0301	434-845-0306	rhalpin@englishconst.com
HOWARD LUCK	Norfolk	757-441-5678 328-1881		Howard.Luck@Norfolk.gov

17. Sham or Collusive Bids.

17.1. The Bids of any Bidder or Bidders who engage in collusive bidding shall be rejected. Any Bidder who submits more than one Bid in such a manner as to make it appear that the Bids submitted are on a competitive basis from different parties shall be considered a collusive Bidder.

17.2. The provisions contained in Sections 2.2-4367 through 2.2-4377, Code of Virginia, as amended, shall be applicable to all contracts solicited or entered into by Owner. By submitting their Bids, all Bidders certify that their Bids are made without collusion or fraud, and that they have not offered or received any kickbacks or inducements from any other Bidder, Supplier, manufacturer or subcontractor in connection with their Bid, and they have not conferred with any public employee having official responsibility for this procurement transaction, any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.

18. Time of Essence

18.1 As the provisions hereof relating to the time for performance and completion of the Work are for the purpose of enabling the Owner to proceed with the construction of public improvements in accordance with pre-planned programs, such provisions are of the essence.

19. Project Documents

19.1 The Hampton Roads Planning District Commission Regional Standards Fifth Edition are hereby defined as the City of Norfolk, Department of Utilities Standard Specifications. Department of Public Works Standard Specifications, latest edition and the accompanying Project Documents are intended to supplement each other, so that anything shown on the accompanying Project Documents but not mentioned in the specifications, or vice versa, shall be required as if both specified and shown. In the event of a conflict between the standards and specifications referenced herein, the order of precedence shall be as follows: Special Provisions, Project Documents, Regional Standards, City of Norfolk Department of Utilities Standard Design Criteria, City of Norfolk Department of Public Works Standard Specifications, Supplemental Specifications.

III. BID FORM

Bids to be opened:	Time **(3:00) p.m.,** **Tuesday, February 24, 2015**
Work to be Completed in:	Substantial Completion: **490 Calendar Days** Final Completion: **520 Calendar Days**
Liquidated Damages:	**One Thousand Dollars and No Cents ($1000.00) per calendar day after time for Substantial Completion has expired.** **Five Hundred Dollars and No Cents ($500.00) per calendar day after time for Final Completion has expired.**
Performance Bond:	100%
Payment Bond:	100%

D. Contract Price

The Owner shall pay the Contractor as just compensation for the satisfactory performance of the Work, subject to any additions or deductions as provided in **the contractor's bid, Section 102, Clause III Bid Form submitted on February 24, 2015.**

The Contract Price is _____ ($_____) based upon unit and/or lump sum prices extended as **submitted in the contractor's bid, Section 102, Clause III Bid Form dated February 24, 2015**.

E. Payments

The Owner will pay the Contract Price to the Contractor in the manner and at such times as set forth in Section 109 of the Hampton Roads Planning District Commission *Regional Construction Standards,* Fifth Edition, as referenced in Section I. below and as specifically revised for this Project.

F. Time

The undersigned Contractor agrees to commence Work within **10** Days after the date of Notice to Proceed and further agrees to substantially Complete all Work under this Agreement within **480** Days from the date of the Notice to Proceed and to reach Final Completion of all Work under this Agreement within **520** Days from the date of the Notice to Proceed.

G. Applicable Law/Compliance

(1) Applicable Law

This Agreement shall be deemed to be a Virginia contract and shall be governed as to all matters of validity, interpretations, obligations, performance, or otherwise, exclusively by the laws of the Commonwealth of Virginia, and all questions arising with respect thereto shall be determined in accordance with such laws. Regardless of where actually delivered and accepted, this Agreement shall be deemed to have been delivered and accepted by the parties in the Commonwealth of Virginia.

(2) Compliance with all Laws

Contractor shall comply with all federal, state and local statutes, ordinances, and regulations, now in effect or hereafter adopted, in the performance of Work set forth herein. Contractor represents that it possesses all necessary licenses and permits required to conduct its business and will acquire any additional license and permits necessary for performance of this Agreement prior to the initiation of Work. [If the Contractor is a corporation] Contractor further expressly represents that it is a corporation in good standing in the Commonwealth of Virginia and will remain in good standing throughout the term of the contract. Contractor shall at all times observe all health and safety measures and precautions necessary for the sanitary and safe performance of the contract Work.

(3) Venue

Any and all suits for any claims or for any breach or dispute arising out of these Contract Documents shall be maintained in the appropriate court of competent jurisdiction in the City of Norfolk.

VIII. NOTICE TO PROCEED

TO: _____ DATE: _____

_____ PROJECT: **Lake Prince Raw Water Pumping Station Flood Protection and Miscellaneous Improvements**

_____

_____

You are hereby notified to commence Work in accordance with the Agreement dated _____, 20___, on or before _____, 20___, and you are to substantially complete the Work within _**480**_ Days thereafter and reach Final Completion of the Work within _**520** Days thereafter. The date of Final Completion of all Work is therefore _____, 20___.

Liquidated damages as stipulated in the Bid Form, in the amount of **$1000.00 per Calendar Day for failure to meet the substantial completion date and $500.00 per Calendar Day for failure to meet the final completion date** will be assessed by the Owner for failure of the Contractor to complete the Work on or before the Date of **Substantial and Final Completion** stated above or as may be modified by duly executed Change Orders. **If Substantial completion has not been achieved by the scheduled Final completion date, the liquidated damages will run concurrently until substantial completion is achieved.**

OWNER: City of Norfolk

BY: _____

TITLE: _____

ACCEPTANCE OF NOTICE:

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by:

_____

this the _____ day of

_____, 20 ____

CONTRACTOR:_____

BY: _____

TITLE: _____

End of Section

SECTION 01106

CONSTRUCTION SCHEDULING, COORDINATION AND SEQUENCING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Construction work under this contract shall have the least amount of interferences with the operations of existing facilities. Existing facilities must be maintained in continuous operation at all times during the course of the work under this Contract, except for the Scheduled Station Shutdown Period of July 6, 2016 through October 26, 2016.

B. All operations of valves and gates required to perform the work shall be done by the Owner. The Owner or his designated agent shall be informed in writing at least 24 hours or longer where specified, in advance of the need to operate valves or gates or other actions which could affect facility operations.

C. There may be other Contractors working at these facilities at the same time. The Contractor shall schedule and perform his work in a manner that shall not interfere or delay the performance of other Contractors or consultants engaged in other City projects. If the Contractor becomes aware of any circumstances whereby the Project shall adversely affect any other project on site or vice versa, he will immediately notify the Engineer and indicate what actions, if any, are needed to coordinate the work of the various projects.

D. At all times the Contractor shall maintain existing access roads or provide an alternate roadway to allow the Owner access to the facilities.

E. No extra payment shall be made for any labor, materials, tools, equipment or temporary facilities required during the construction and/or rehabilitation of facilities. All costs therefore shall be considered to have been included in the price bid of the Proposal.

1.02 SUBMITTALS

A. The Contractor shall develop a sequence of construction and submit it to the Owner and Engineer for review and approval.

B. Prior to the Scheduled Station Shutdown Period, the Contractor shall submit to the

G. The valve shall be shop coated with NSF-61 certified epoxy on internal surfaces in accordance with AWWA C550.

2.03 PILOT SYSTEM

A. The valve shall be operated by a system of pilot controls necessary to perform the specified functions.

B. The pilot system shall be factory pre-piped, installed on the main valve and tested as an assembly.

C. In addition to the necessary pressure regulating and electrically operated pilots, the system shall incorporate a wye-strainer and opening/closing speed control valves.

D. Sufficient isolating valves and pipe unions shall be provided to facilitate removal and maintenance of the pilot system without disturbing the main valve.

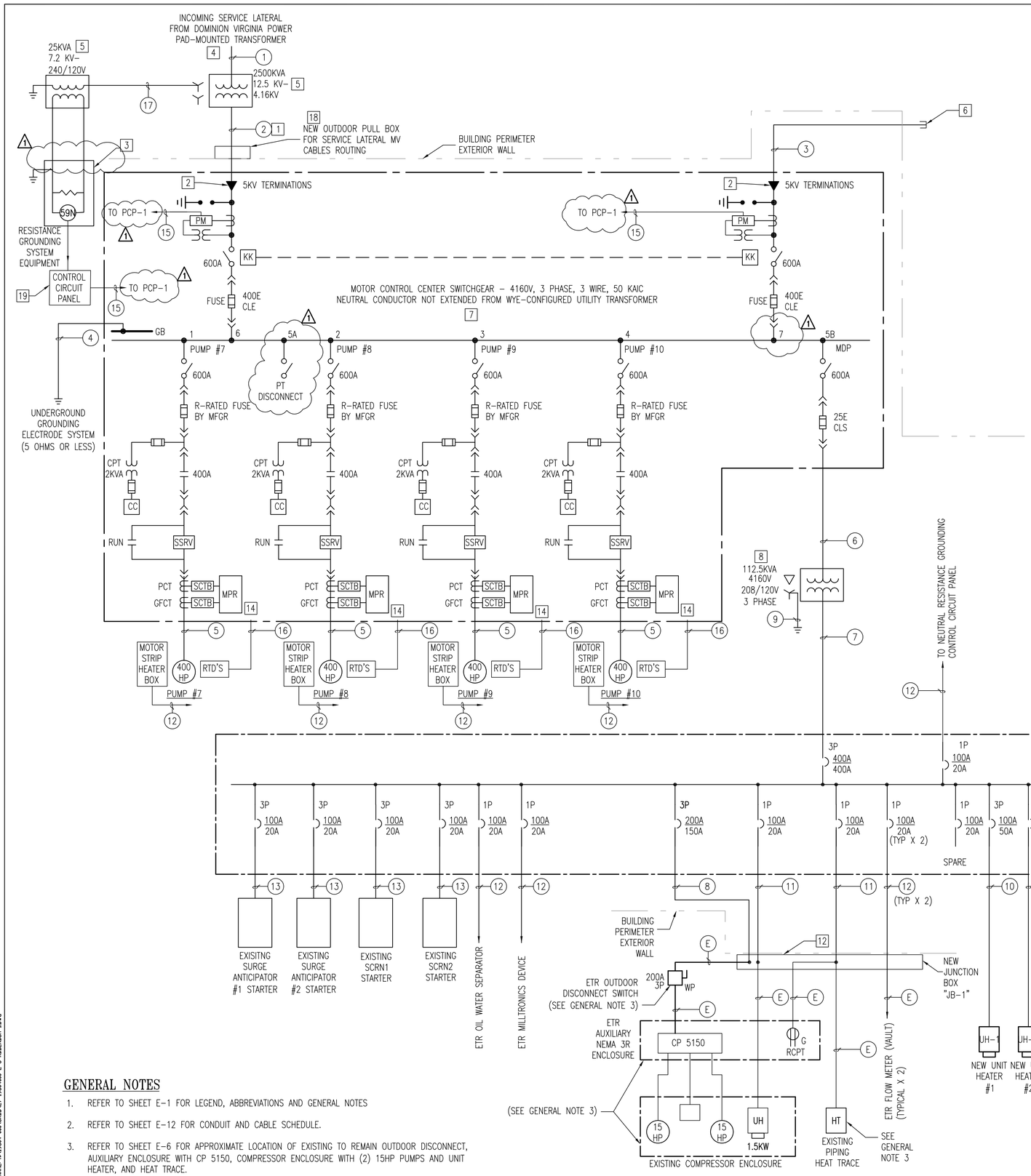
E. Pilots, controls, piping and fittings shall be corrosion resistant copper, bronze or brass.

F. The limit switch shall be DPDT type.

2.04 FUNCTION

A. The sustaining electric check pump control valve shall function to minimize the surge associated with the starting and stopping of the pump. The valve operation shall be controlled by use of solenoid pilot valves and powered by water pressure obtained from the inlet or outlet side of the main valve.

B. The sustaining electric check pump control valve shall open at a controlled rate of speed when the upstream pressure (pump discharge) has satisfied the pressure setting of the back pressure sustaining pilot and both the normal and emergency solenoid pilot controls are energized. When the valve begins opening, the indicator rod shall actuate a limit switch tied in with the pump motor starter circuit. The valve will then throttle at whatever position is required to maintain the upstream (pump discharge) head as per the setting on the Back Pressure Sustaining Pilot. De-energizing the normal solenoid pilot shall initiate a normal controlled valve closure. At a point near its seated position, the check valve indicator rod shall actuate the limit switch which shall de-energize the pump motor and the emergency solenoid pilot. The actuating point on the limit switch shall be adjustable.



SPECIFIC NOTES:

1. PROVIDE 2-WAY SCHEDULE 40 PVC CONCRETE ENCASED CONDUIT. COORDINATE WITH EXISTING UNDERGROUND CONDUITS AND WET PIPES.
2. COORDINATE MOV SURGE ARRESTERS WITH NEUTRAL GROUNDING RESISTOR.
3. PROVIDE FLOOR MOUNTED 240V L-L, 120V L-N, 60HZ, CONTINUOUS/385 °C DUTY CYCLE RATED HIGH RESISTANCE NEUTRAL RESISTOR, WITH STAINLESS STEEL NEMA 4X ENCLOSURE. PROVIDE PULSER RESISTOR, AND 59N GROUND FAULT OVERVOLTAGE RELAY, AND WIRING TO NEUTRAL RESISTANCE GROUNDING CIRCUIT CONTROL PANEL.
4. PRIMARY FEEDER AND RACEWAY BY DVP. COORDINATE WITH DVP FOR CONNECTION AND TERMINATION OF CABLES.
5. CONCRETE PAD MOUNTED UTILITY TRANSFORMER BY DVP. COORDINATE WITH DVP FOR CABLES TERMINATION AND GROUNDING REQUIREMENTS.
6. PROVIDE CONDUIT LOCKABLE CAPS.
7. PROVIDE PLATFORM MOUNTED 2000A, 5KV, 3 PHASE, 50KAIC, NEMA-12 MOTOR CONTROL CENTER SWITCHGEAR WITH RATED MV MAIN AND DISTRIBUTION FUSIBLE DISCONNECTS, REDUCED VOLTAGE SOLID-STATE STARTERS, PROTECTIVE RELAYS, SURGE ARRESTERS, CT'S, DIGITAL METERS, AND REQUIRED APPURTENANCES AS A COMPLETE SYSTEM; MANUFACTURED BY EATON MODEL AMPGARD. REFER TO BASIS OF DESIGN FOR ADDITIONAL REQUIREMENTS.
8. PROVIDE PATFORM MOUNTED 112.5KVA, 4.16KV DELTA - 208Y/120V, 3 PHASE, NEMA-3R VENTILATED DRY TYPE TRANSFORMER.
9. PROVIDE SURFACE MOUNTED 600A BUS, 400A MCB, 208Y/120V, 3 PHASE, 4 WIRE, 22KAIC, 72 POLES, NEMA-12 PANELBOARD MANUFACTURED BY EATON MODEL POW-R-LINE 3A WITH INTEGRAL SPD OR APPROVED EQUAL.
10. PROVIDE INTEGRAL IN PANELBOARD MOUNTED 160KA, 208V, 3 PHASE, 4 WIRE SURGE PROTECTION DEVICE MANUFACTURED BY EATON MODEL SPD 160 208Y 3 A OR APPROVED EQUAL.
11. PROVIDE NEW LIGHTING FIXTURE. REPLACE EXTERIOR LIGHTING, CONDUIT AND WIRING.
12. REMOVE EXISTING JB-1 BOX AND REPLACE IT WITH NEMA 4X STAINLESS STEEL TYPE 316 BOX SIZED AS REQUIRED. INTERSECT EXISTING BRANCH CIRCUIT CONDUCTORS AND SPLICE WITH INSULATED RATED LUGS WITHIN NEW JUNCTION BOX. PROVIDE GROUNDING BUSHINGS AND BONDING.
13. INSTALL RELOCATED SURGE CONTROL PANEL. PROVIDE BRANCH CIRCUIT. REFER TO INSTRUMENTATION DRAWINGS FOR ADDITIONAL WIRING REQUIREMENTS.
14. REFER TO INSTRUMENTATION DRAWINGS FOR WIRING TERMINATIONS AT RESPECTIVE MOTOR MONITOR RELAY.
15. INSTALL PUMP CONTROL PANEL AND BRANCH CIRCUIT. REFER TO INSTRUMENTATION DRAWINGS FOR ADDITIONAL WIRING REQUIREMENTS.
16. INSTALL NEW VENTILATION CONTROL PANEL "VCP-1". PROVIDE INPUT AND OUTPUT CIRCUITS. TERMINATE CONDUCTORS AT EACH EXISTING EQUIPMENT WHERE INDICATED.
17. NOT USED.
18. PROVIDE CUSTOM OUTDOOR SURFACE MOUNTED 36"W X 60"H X 18"D METAL PULL BOX (ENCLOSURE) NEMA 3R RAIN TIGHT, 14 GAUGE STAINLESS STEEL TYPE 316, HINGED, PAD LOCKABLE; MANUFACTURED BY WEATHERALL ENCLOSURES OR APPROVED EQUAL. WEATHERALL ENCLOSURES COMPANY INFORMATION IS: 1707 HYDRO DRIVE, AUSTIN, TEXAS 78728, 877-939-7139, GDWILLIAMSON@WEATHERALLENCLOSURES.COM.
19. PROVIDE VOLTAGE ALARM INDICATOR CONTROL PANEL MANUFACTURED BY I-GARD MODEL SLEUTH OR APPORVED EQUAL.

GENERAL NOTES

1. REFER TO SHEET E-1 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES
2. REFER TO SHEET E-12 FOR CONDUIT AND CABLE SCHEDULE.
3. REFER TO SHEET E-6 FOR APPROXIMATE LOCATION OF EXISTING TO REMAIN OUTDOOR DISCONNECT, AUXILIARY ENCLOSURE WITH CP 5150, COMPRESSOR ENCLOSURE WITH (2) 15HP PUMPS AND UNIT HEATER, AND HEAT TRACE.

REVISIONS		
1	REVISED AS PER ADDENDUM 1	02/18/15

CITY OF NORFOLK
DEPARTMENT OF UTILITIES

400 GRANBY STREET
NORFOLK, VIRGINIA 23501

LAKE PRINCE RAW WATER PUMPING STATION FLOOD MITIGATION AND MISCELLANEOUS IMPROVEMENTS

KEY PLAN

GRAPHIC SCALES

SIGNATURE

COMMONWEALTH OF VIRGINIA
AMITAVA PODDER
Lic. No. 012910
12/12/14
PROFESSIONAL ENGINEER

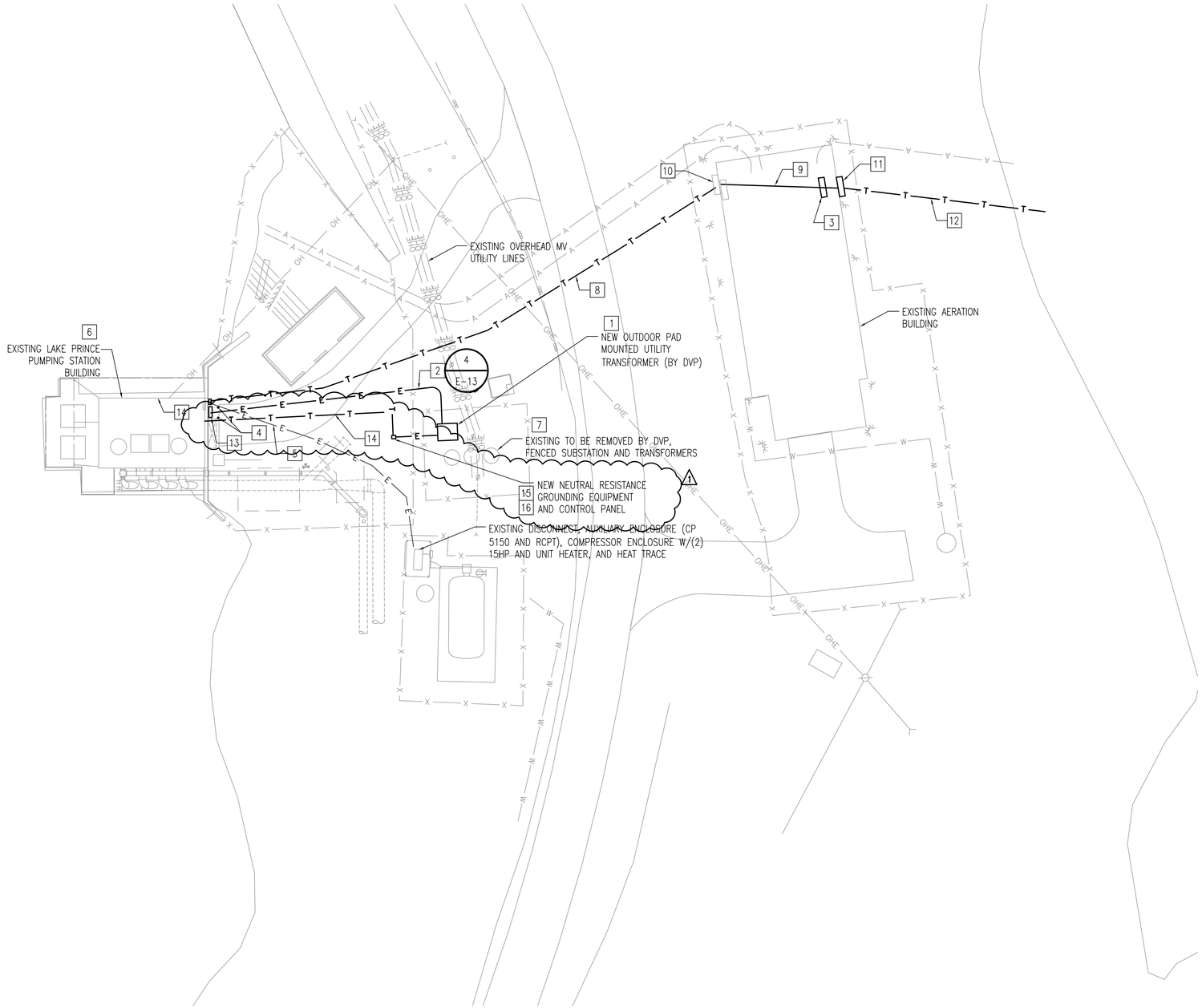
WR&A
WHITMAN, REQUARDT & ASSOCIATES, LLP
5101 Cleveland Street, Suite 620, Virginia Beach, VA 23462

ONE LINE DIAGRAM - NEW WORK

Drawing No.

E-5

Scale: NONE		
Date: DEC. 12, 2014	Sheet 27 of 44	
Des: RW	Drawn: CSB	Check: AP



1 / E-6 SITE PLAN - NEW WORK

SCALE: 1"= 20'

GENERAL NOTES

1. REFER TO DWG E-1 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. REFER TO DRAWING E-5 ONE LINE DIAGRAM FOR SERVICE AND FEEDER REQUIREMENTS, AND ADDITIONAL INFORMATION.

SPECIFIC NOTES

1. PAD MOUNTED 2500KVA, 12.5KV WYE – 4.16KV WYE WITH NEUTRAL GROUNDING RESISTOR, 3 PHASE UTILITY TRANSFORMER BY DVP. COORDINATE DUCTBANK CONDUIT PENETRATIONS, AND GROUNDING REQUIREMENTS PER DVP STANDARDS.
2. PROVIDE CONCRETE ENCASED DUCTBANK RACEWAY WITH SECONDARY SERVICE LATERAL CONDUCTORS. PROVIDE LOAD BREAK LUGS AND SURGE PROTECTION AS PER DVP STANDARDS. COORDINATE WITH DVP FOR SECONDARY CABLES TERMINATIONS.
3. PROVIDE FIBER OPTIC PATCH PANEL WITH BELDEN DIN RAIL MOUNTED PANELS.
4. PROVIDE 4-1/2" DIAMETER X 84" STEEL PIPE HEIGHT REMOVABLE BOLLARDS WITH PLASTIC POST COVERS MANUFACTURED BY RELIANCE FOUNDRY MODEL R-1007-04 STEEL PIPE BOLLARD AND MODEL R-7110 BOLLARD COVER OR APPROVED EQUAL. SPACE THEM AT 4'-0" INTERVALS.
5. PROVIDE FEEDER AND BRANCH CIRCUIT CONDUCTORS FROM NEW PANELBOARD TO EXISTING AIR COMPRESSORS AND EQUIPMENT HOUSING. REFER TO DRAWING E-7 FOR FEEDER AND BRANCH CIRCUITS REQUIREMENTS, AND ADDITIONAL INFORMATION.
6. REFER TO DRAWING E-7 GRADE LEVEL POWER PLAN FOR CONTINUATION AND TERMINATION RACEWAYS WITH SERVICE, FEEDER AND BRANCH CIRCUITS CONDUCTORS.
7. EXISTING MV UTILITY SUBSTATION TO BE REMOVED BY DVP. DVP WILL PROVIDE UTILITY TRANSFORMERS FOR PUMPING STATION POWER LOAD AND NEUTRAL RESISTOR BANK. DVP WILL PHASE OUT EXISTING UTILITY 3-750KVA 13.2KV-2.3KV SUBSTATION TRANSFORMERS AND APPURTENANCES, AND PROVIDE SPACE AND NEW PAD MOUNTED TRANSFORMER. COORDINATE WITH DVP FOR TRANSFORMERS FINAL LOCATION.
8. PROVIDE OUTDOOR RATED FIBER OPTIC CABLE IN EXISTING 3" UNDERGROUND RACEWAY FROM PUMP STATION BUILDING TO EXISTING AERATION COMPRESSOR BUILDING. EXTEND FIBER OPTIC CABLE TO RESPECTIVE BUILDING F.O. PATCH PANEL. TERMINATE F.O. CABLE STRANDS. REFER TO INSTRUMENTATION DRAWINGS AND SPECIFICATIONS FOR REQUIREMENTS AND ADDITIONAL INFORMATION.
9. PROVIDE OVERHEAD ROUTED MARINE RATED FIBER OPTIC CABLE IN 2" RGS CONDUIT. EXTEND FIBER OPTIC CABLE TO RESPECTIVE BUILDING F.O. PATCH PANEL. TERMINATE F.O. CABLE STRANDS. REFER TO INSTRUMENTATION DRAWINGS FOR ADDITIONAL REQUIREMENTS.
10. EXISTING WALL MOUNTED PULL BOX USED TO ROUTE NEW FIBER OPTIC CABLE.
11. PROVIDE SURFACE MOUNTED 36" X 36" X 12" PULL BOXES STAINLESS STEEL TYPE 316 NEMA 4X FOR ROUTING OF NEW FIBER OPTIC CABLE.
12. PROVIDE DIRECT BURIED 4" PVC SCHEDULE 80 CONDUIT BURIED AT 36" BELOW GRADE FROM BUILDING TO 20 FT INTO LAKE. PROVIDE FIBER OPTIC CABLE FROM AERATION BUILDING TO WESTERN BRANCH PUMPING STATION WBPS BUILDING. EXTEND FIBER OPTIC CABLE TO RESPECTIVE BUILDING F.O. PATCH PANEL. TERMINATE F.O. CABLE STRANDS. REFER TO INSTRUMENTATION DRAWINGS FOR ADDITIONAL REQUIREMENTS.
13. PROVIDE METAL PULL BOX. REFER TO DRAWING E-7 FOR REQUIREMENTS.

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14. PROVIDE 4 CONDUCTOR SHIELDED CABLE IN CONCRETE ENCASED CONDUIT. CABLE SHALL RUN FROM INTERIOR PCP-1 PANEL TO THE OUTDOOR NEUTRAL RESISTOR GROUNDING CONTROL PANEL GROUND FAULT RELAY CONTACTS. REFER TO INSTRUMENTATION DRAWINGS FOR TERMINATION AND ADDITIONAL REQUIRED COMMUNICATION HARDWARE.
15. PROVIDE NEUTRAL RESISTANCE GROUNDING CONTROL PANEL IN VENTILATED NEMA 3R ENCLOSURE. MOUNT CONTROL PANEL AT THE NEUTRAL RESISTANCE GROUNDING EQUIPMENT.
16. NEUTRAL RESISTANCE GROUNDING EQUIPMENT SHALL BE MOUNTED ON A 3'-0" ABOVE FINISHED GRADE ON TOP OF A CONCRETE PAD. EXTEND CONCRETE PAD 6" OUT AND AROUND FROM THE PERIMETER OF THE EQUIPMENT.

REVISIONS		
1	REVISED AS PER ADDENDUM 1	02/18/15

CITY OF NORFOLK
DEPARTMENT OF UTILITIES

400 GRANBY STREET
NORFOLK, VIRGINIA 23501

LAKE PRINCE RAW WATER PUMPING STATION FLOOD MITIGATION AND MISCELLANEOUS IMPROVEMENTS

KEY PLAN

GRAPHIC SCALES

0 10' 20' 40'

SCALE: 1" = 20'

SIGNATURE

COMMONWEALTH OF VIRGINIA
AMITAVA PODDER
Lic. No. 012910
2/12/14
PROFESSIONAL ENGINEER

WHITMAN, REQUARDT & ASSOCIATES, LLP
5701 Cleveland Street, Suite 620, Virginia Beach, VA 23462

ELECTRICAL SITE PLAN
-NEW WORK

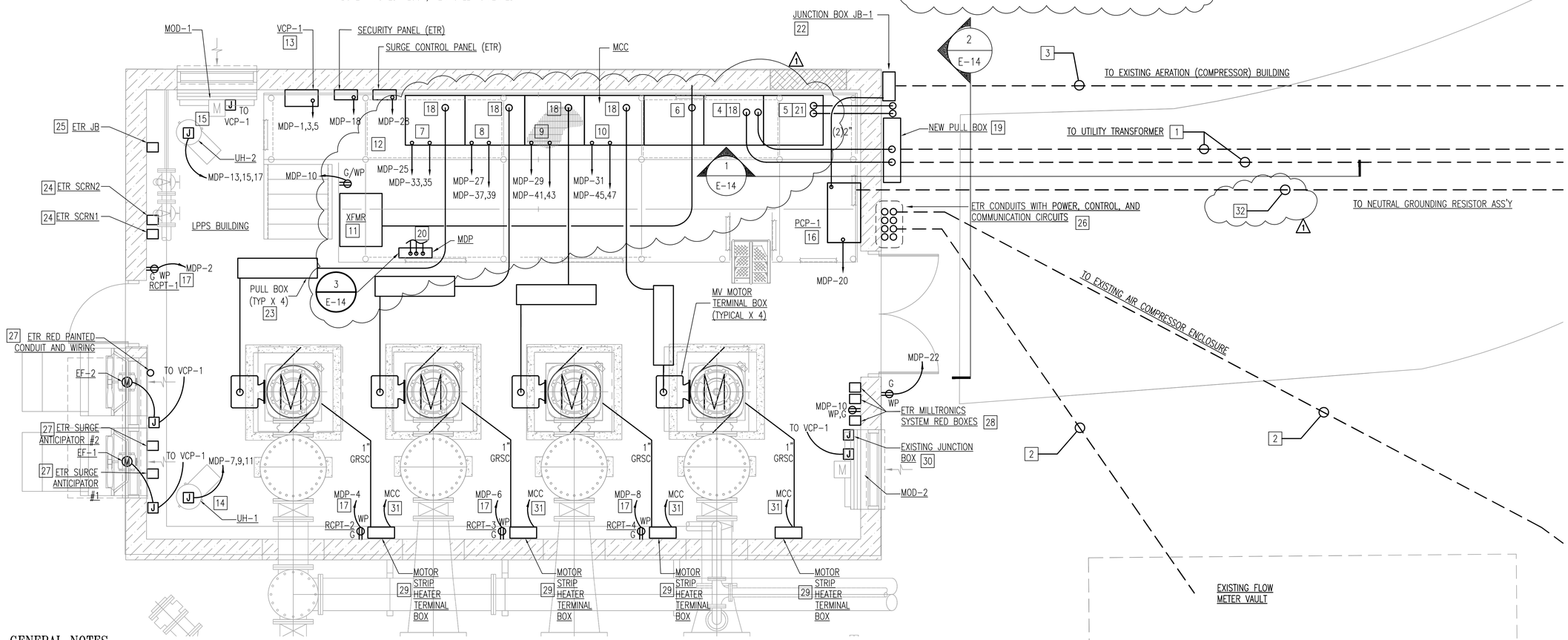
Drawing No.

E-6

Scale: AS NOTED			
Date: DEC. 12, 2014		Sheet 28 of 44	
Des: RW	Drawn: CSB		Check: AP

SPECIFIC NOTES

1. REFER TO DWG E-6 FOR SERVICE LATERAL ROUTING
2. EXISTING UNDERGROUND RACEWAYS AND CIRCUIT CONDUCTORS TO THE FLOW METER AND VALVE VAULT, AND SURGE TANK/AIR COMPRESSOR PAD. EXTEND FEEDER AND BRANCH CIRCUITS TO NEW PANEL "MDP". SPLICE EXISTING AND NEW CONDUCTORS WITHIN NEW PULL BOX "JB-1".
3. REFER TO DWG E-6 FOR FIBER-OPTIC RACEWAY ROUTING TO AERATION BLDG PULL BOX
4. 4160V MAIN FUSED INTERRUPTER SWITCH (MIS)
5. 4160V FUSED INTERRUPTER SWITCH (PGIS) TO PORTABLE GENERATOR VIA EMPTY CONDUITS WITH PULL STRING AND CAP PROVISION. REFER TO DWG E-14 FOR ROUTING OF CONDUIT AND LOCATION OF WALL PENETRATION. REFER TO DWG E-5 FOR RACEWAY AND CONDUCTOR SIZING.
6. 4160V FUSED INTERRUPTER SWITCH (TIS) TO INTERIOR DRY-TYPE TRANSFORMER (STACKED BELOW PGIS) – REFER TO DWG E-5 FOR RACEWAY AND CONDUCTOR SIZING.
7. 4160V REDUCED VOLTAGE SOLID-STATE STARTER TO PUMP #7 – REFER TO DWG E-5 FOR RACEWAY AND CONDUCTOR SIZIING.
8. 4160V REDUCED VOLTAGE SOLID-STATE STARTER TO PUMP #8 – REFER TO DWG E-5 FOR RACEWAY AND CONDUCTOR SIZING.
9. 4160V REDUCED VOLTAGE SOLID-STATE STARTER TO PUMP #9 – REFER TO DWG E-5 FOR RACEWAY AND CONDUCTOR SIZIING.
10. 4160V REDUCED VOLTAGE SOLID-STATE STARTER TO PUMP #10 – REFER TO DWG E-5 FOR RACEWAY AND CONDUCTOR SIZIING.
11. PROVIDE PLATFORM MOUNTED 112.5-KVA DRY-TYPE TRANSFORMER – REFER TO DWG E-5 FOR UNDERGROUND RACEWAY AND CONDUCTOR SIZING; ENSURE THE TRANSFORMER IS NOT IN FRONT OF THE MCC
12. PANEL MDP – REFER TO DWG'S E-5 AND E-11 FOR REQUIREMENTS. PROVIDE STAINLESS STEEL METAL STRUCTURE WITH HORIZONTAL AND VERTICAL SUPPORTS AS REQUIRED TO PREVENT SWAY.
13. VENT CONTROL PANEL WITH INTERGRAL STARTERS AND THERMOSTAT. REFER TO DWG I-6 FOR WIRING DIAGRAM
14. NEW 12.5 KW ELECTRIC UNIT HEATER #1 WITH INTEGRAL DISCONNECT SWITCH AND REMOTE THERMOSTAT. MOUNT JUNCTION BOX ON UNDERSIDE OF CEILING AND EXTEND CIRCUIT TO HEATER USING FLEXIBLE METAL CONDUIT. REFER TO DWG I-6 FOR WIRING DIAGRAM
15. NEW 12.5 KW ELECTRIC UNIT HEATER #2 WITH INTEGRAL DISCONNECT SWITCH AND REMOTE THERMOSTAT. MOUNT JUNCTION BOX ON UNDERSIDE OF CEILING AND EXTEND CIRCUIT TO HEATER USING FLEXIBLE METAL CONDUIT. REFER TO DWG I-6 FOR WIRING DIAGRAM
16. PUMP CONTROL PANEL PCP-1. REFER TO INSTRUMENTATION DRAWINGS FOR ADDITIONAL REQUIREMENTS.
17. PROVIDE DEDICATED GFCI RECEPTACLE, MOUNT RECEPTACLE 5'-0" ABOVE FINISHED FLOOR, VERTICALLY ORIENTED.
18. PROVIDE OVERHEAD RIGID GALVANIZED STEEL CONDUIT WITH SHORT BENDS ABOVE THE MCC. CONDUIT SHALL PROVIDE 12 TIMES (MIN) MV CABLE BENDING RADIUS. PROVIDE GROUNDING BUSHINGS AND BONDING AT BOTH ENDS. THREE 90 DEGREES (MAX) OF CONDUIT BEND IS ALLOWED, PROVIDE PULL BOX TO COMPLY.
19. PROVIDE OUTDOOR SURFACE MOUNTED METAL PULL BOX TO ROUTE MV SERVICE LATERAL SECONDARY FEEDER TO CONTINUE OVERHEAD TO THE INTERIOR MV MCC SWITCHGEAR MAIN OVERCURRENT PROTECTION DEVICE CABINET. REFER TO DRAWING E-5 FOR REQUIREMENTS.
20. PROVIDE FEEDER AND BRANCH CIRCUITS FROM PANEL MDP. SPLICE THE FOLLOWING FEEDERS AND BRANCH CIRCUITS WITHIN JUNCTION BOX "JB-1" TO PROVIDE POWER TO THE FOLLOWING EXISTING TO REMAIN COMPRESSOR SYSTEM EQUIPMENT AT SURGE TANK: OUTDOOR 200A DISCONNECT SWITCH, AUXILIARY ENCLOSURE (CP 5150 AND GFCI RECEPTACLE), COMPRESSOR ENCLOSURE ((2) 15HP PUMPS AND UNIT HEATER), AND HEAT TRACE.
21. ~~PROVIDE RIGID GALVANIZED STEEL CONDUIT WITH SHORT BENDS ROUTED BELOW THE MCC PLATFORM. CONDUIT SHALL PROVIDE 12 TIMES (MIN) MV CABLE BENDING RADIUS. PROVIDE GROUNDING BUSHINGS AND BONDING AT BOTH ENDS. PROVIDE PULL STRINGS AND CONDUIT LOCKABLE CAP.~~
22. PROVIDE STAINLESS STEEL TYPE 316 NEMA 4X BOX SIZED AS REQUIRED.
23. PROVIDE PENDANT MOUNTED 48" X 18" X 12" STAINLESS STEEL PULL BOX.
24. PROVIDE RACEWAY AND WIRING FROM PANEL MDP. REFER TO DRAWING M3 DETAIL 2 FOR APPROXIMATE LOCATION OF EQUIPMENT.
25. RELOCATE JUNCTION BOX AT 5'-0" AFF. PROVIDE RACEWAY FROM PANEL MDP.
26. EXISTING CONDUITS WITH WIRING LEADING TO NEW JB-1 SPLICE BOX. INTERSECT EXISTING POWER, CONTROL, AND COMMUNICATION CIRCUITS WIRING WITHIN JB-1, AND PROVIDE RACEWAY AND WIRING TO NEW OR RELOCATED POWER, CONTROL OR COMMUNICATION PANEL SOURCES AS APPLICABLE PER SYSTEM.
27. PROVIDE RACEWAY AND WIRING FROM NEW PANEL MDP. OVERCURRENT PROTECTION SHALL MATCH EXISTING AMPACITY RATING AND NUMBER OF POLES.
28. MILLTRONICS SYSTEM: PROVIDE 12" X 12" 8" NEMA 4X BOX WITH RELAYS, FUSES, AND SWITCHES TO SIMULATE ORIGINAL INSTALLATION AND CONNECTIVITY. PROVIDE RACEWAYS AND WIRING FROM NEW PCP, AND MDP PANELS AS APPLICABLE. COORDINATE WITH INSTRUMENTATION DRAWINGS.
29. PROVIDE NEMA 4X ENCLOSURE WITH TERMINAL BLOCKS. REFER TO MECHANICAL AND INSTRUMENTATION DRAWINGS FOR ADDITIONAL REQUIREMENTS.
30. RELOCATE EXISTING RED PAINTED JUNCTION BOX, ASSOCIATED RACEWAY, AND WIRING FROM BELOW TO ABOVE DAMPER LOCATION.
31. PROVIDE 2# 12+ 1#12G IN 3/4" C FOR EACH STRIP HEATER. FED FROM PANEL MDP, PROVIDE CONNECTIONS AT MCC CONTROL TERMINAL BLOCKS, AND MOTOR HEATERS PER MANUFACTURER RECOMMENDATIONS.
32. PROVIDE 4 CONDUCTOR SHIELDED CABLE IN CONCRETE ENCASED CONDUIT FROM PCP-1 CABINET TO THE NEUTRAL GROUNDING RESISTOR CONTROL PANEL GROUND FAULT RELAY CONTACTS. REFER TO E-5 SINGLE LINE DIAGRAM, AND INSTRUMENTATION DRAWINGS FOR ADDITIONAL REQUIREMENTS.



GENERAL NOTES

1. REFER TO DWG E-1 FOR ELECTRICAL LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. REFER TO DWG E-5 FOR ELECTRICAL SINGLE LINE DIAGRAM FOR EQUIPMENT, FEEDERS AND BRANCH CIRCUITS REQUIREMENTS FOR NEW AND ETR EQUIPMENT, PANELS AND SYSTEMS.
3. REFER TO DWG E-9 FOR MOTOR CONTROL CENTER ELEVATION.
4. REFER TO DWG E-14 FOR SERVICE LATERAL AND TEMPORARY GENERATOR FEEDER ROUTINGS, AND CONNECTION BOX ELEVATION DETAIL FOR ADDITIONAL REQUIREMENTS.
5. RACEWAYS PENETRATING THE EXTERIOR WALLS SHALL BE FIREPROOF AND SEALED TO PREVENT MOISTURE/CONDENSATION FROM ENTERING THE BUILDING.
6. REFER TO INSTRUMENTATION "I" DRAWINGS FOR ADDITIONAL CONDUIT AND WIRING REQUIREMENTS.

1 / E-7 GRADE LEVEL – POWER PLAN
SCALE: 3/8" = 1'-0"

REVISIONS		
1	REVISED AS PER ADDENDUM 1	02/18/15

CITY OF NORFOLK
DEPARTMENT OF UTILITIES

400 GRANBY STREET
NORFOLK, VIRGINIA 23501

LAKE PRINCE RAW WATER PUMPING STATION FLOOD MITIGATION AND MISCELLANEOUS IMPROVEMENTS

KEY PLAN

GRAPHIC SCALES

0 1' 2' 3' 5'
SCALE: 3/8" = 1'-0"

SIGNATURE

COMMONWEALTH OF VIRGINIA
AMITAVA PODDER
Lic. No. 012910
12/12/14
PROFESSIONAL ENGINEER

WHITMAN, REQUARDT & ASSOCIATES, LLP
5701 Cleveland Street, Suite 620, Virginia Beach, VA 23462

GRADE LEVEL POWER PLAN

Drawing No.
E-7

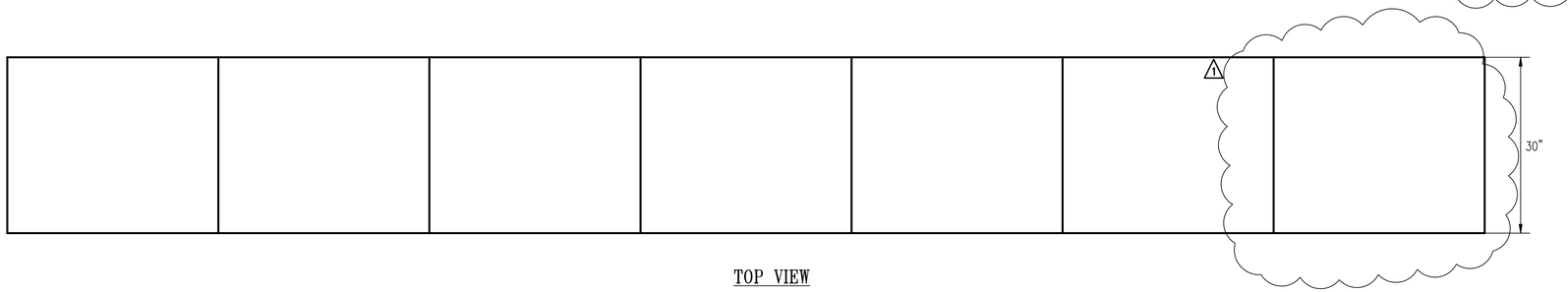
Scale: AS NOTED		
Date: DEC. 12, 2014	Sheet 29 of 44	
Des: RW	Drawn: CSB	Check: AP

GENERAL NOTES

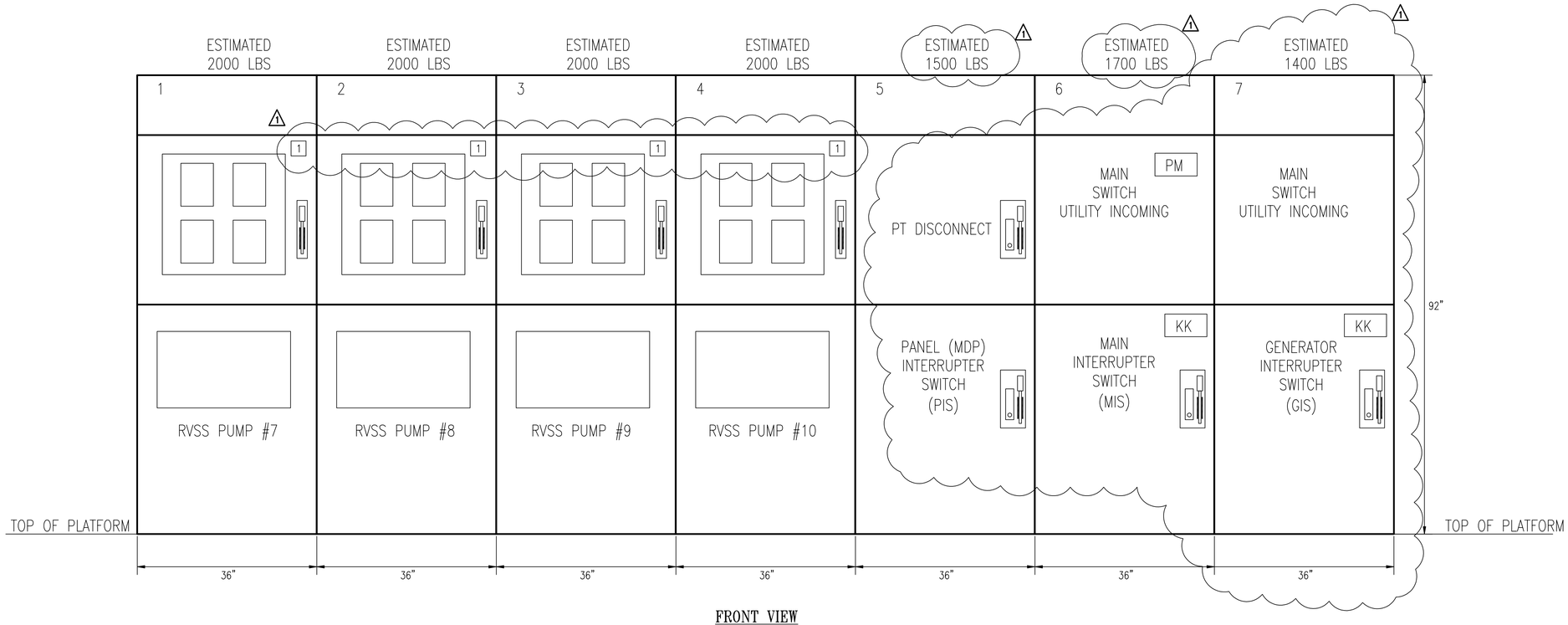
1. REFER TO DWG E-5 FOR ELECTRICAL SINGLE LINE DIAGRAM AND SPECIFICATIONS FOR EQUIPMENT, FEEDERS AND BRANCH CIRCUITS REQUIREMENTS.
2. REFER TO INSTRUMENTATION 1 DRAWINGS FOR ADDITIONAL CONDUIT AND WIRING REQUIREMENTS.

SPECIFIC NOTES

[1] INSTALL WARNING LABEL ON DOOR OF RVSS AND AT MOTOR HEATER JUNCTION BOX: "CAUTION–THIS EQUIPMENT SUPPLIED BY MORE THAN ONE POWER SOURCE"



TOP VIEW



FRONT VIEW

1 / E-9 MOTOR CONTROL CENTER ELEVATION
SCALE: NTS

REVISIONS		
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CITY OF NORFOLK
DEPARTMENT OF UTILITIES

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NORFOLK, VIRGINIA 23501

LAKE PRINCE RAW WATER PUMPING STATION FLOOD MITIGATION AND MISCELLANEOUS IMPROVEMENTS

KEY PLAN

GRAPHIC SCALES

SIGNATURE

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AMITAVA PODDER
Lic. No. 012910
PROFESSIONAL ENGINEER
12/12/14

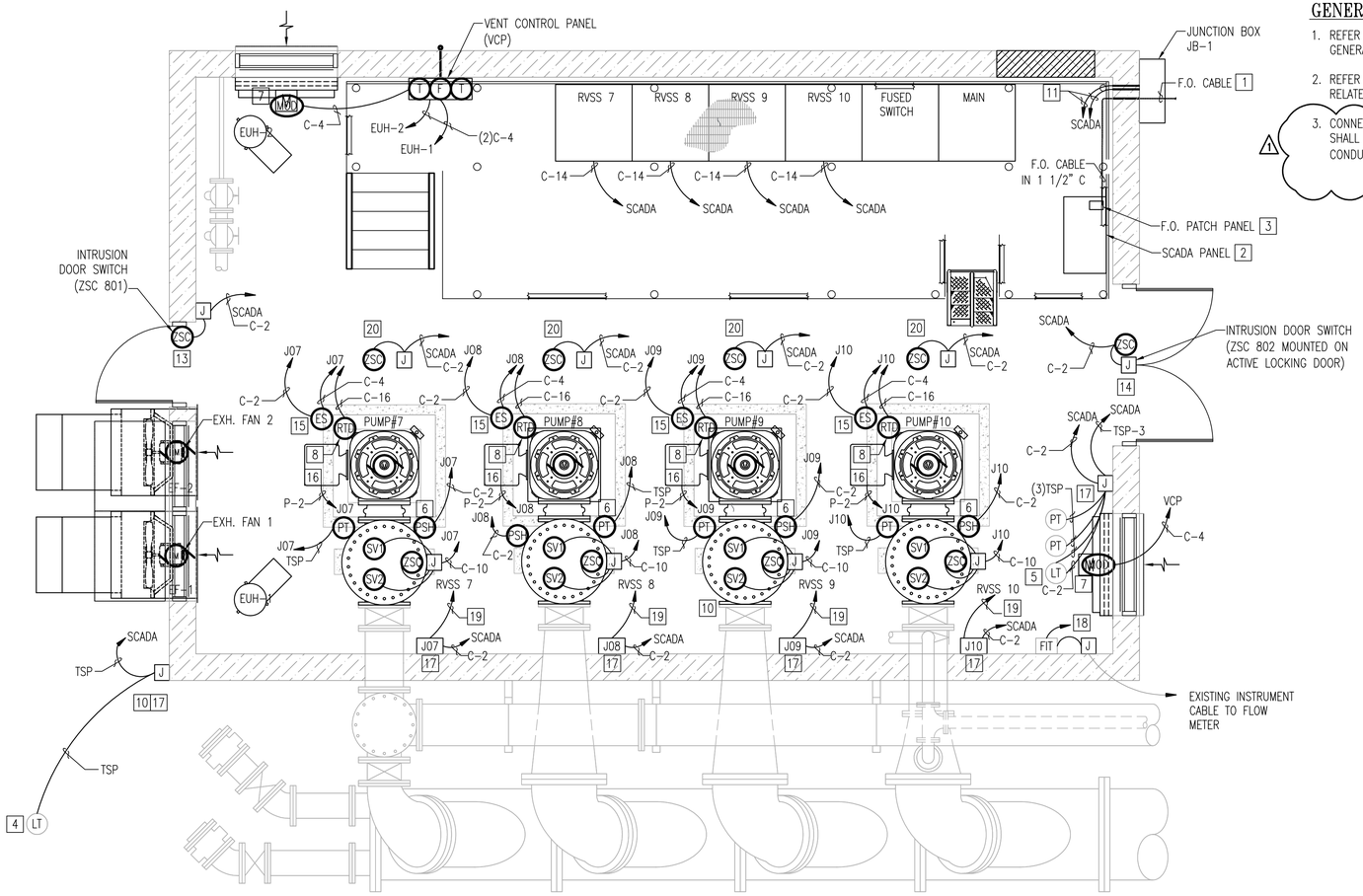
WHITMAN, REQUARDT & ASSOCIATES, LLP
5701 Cleveland Street, Suite 620, Virginia Beach, VA 23462

MEDIUM VOLTAGE MCC – ELEVATION

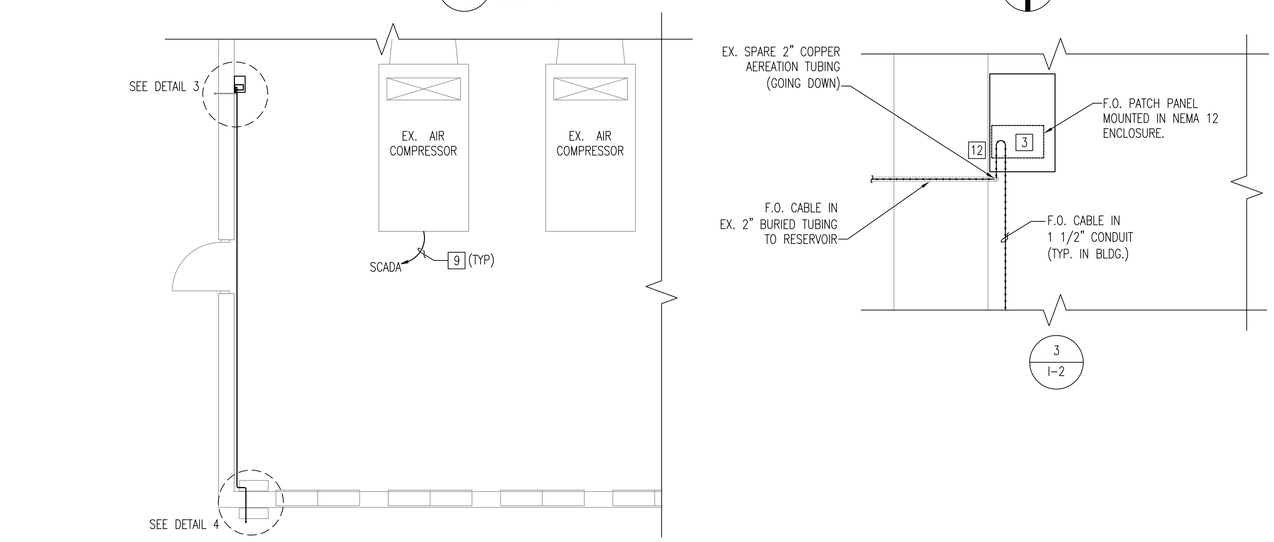
Drawing No.

E-9

Scale: NONE		
Date: DEC. 12, 2014	Sheet 31 of 44	
Des: RW	Drawn: CSB	Check: AP

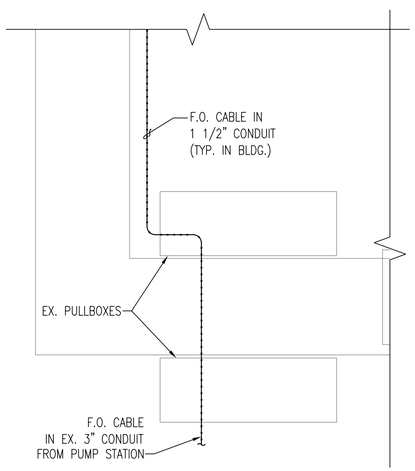


1 I-2 PUMP STATION GRADE LEVEL PLAN - I & C
SCALE: NONE

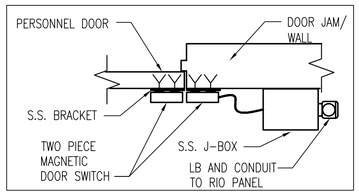


2 I-2 PARTIAL COMPRESSOR BUILDING GRADE LEVEL PLAN - I & C
SCALE: NONE

3 I-2



4 I-2



5 I-2

GENERAL NOTES

1. REFER TO SHEET I-1 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.
2. REFER TO ELECTRICAL SITE PLAN FOR ADDITIONAL CONTROLS RELATED CONDUIT AND CONDUCTORS.
3. CONNECTIONS SHOWN TO MOTORS, VALVES, MODS AND HEATERS SHALL BE MADE WITH LIQUID TIGHT FLEXIBLE METALLIC CONDUIT. NOT TO EXCEED 5' LENGTH.

SPECIFIC NOTES:

1. RUN 24 STRAND FIBER OPTIC CABLE IN EX. 3" BURIED CONDUIT TO EX. COMPRESSOR BUILDING #2 AND TERMINATE IN NEW PATCH PANEL PROVIDED BY CONTRACTOR.
2. PANEL TO BE PROVIDED BY THE CITY FOR INSTALLATION BY CONTRACTOR. COORDINATE FINAL PANEL DIMENSIONS WITH CITY DURING CONSTRUCTION.
3. FIBER OPTIC PATCH PANEL TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
4. LEVEL TRANSDUCER IN LAKE PRINCE.
5. LEVEL TRANSDUCER IN WET WELL BELOW PUMP STATION.
6. REMOVE EXISTING PRESSURE SWITCHES. INSTALL NEW SWITCHES AT +/- 36" AFF.
7. INSTALL NEW MOD(S) AT +/- 36" AFF.
8. EACH MOTOR HAS 6 WINDING RTDs AND 2 BEARING RTDs.
9. EXISTING WIRES AND CONDUIT FROM AIR COMPRESSORS TO LAKE PRINCE SCADA PANEL.
10. ROUTE EX. SENSOR CABLE IN 3/4" C TO J-BOX AND CONTINUE TO SCADA PANEL.
11. PROVIDE CONDUITS FROM JUNCTION BOX AND ROUTE EX. CONDUCTORS AND CABLES FROM AERATION BLDG TO SCADA PANEL. FIELD VERIFY QUANTITY.
12. CONTRACTOR SHALL REMOVE EX. 2" COPPER PIPE, VALVES AND FITTINGS ABOVE EX. UNION COUPLING. PROVIDE MATCHING UNION COUPLING TO CONNECT 2" CONDUIT FROM THE PATCH PANEL ENCLOSURE TO THE 2" COPPER PIPE.
13. SEE DETAIL 5.
14. SEE DETAIL 5. MOUNT J-BOX ON WALL ABOVE ACTIVE DOOR
15. PROVIDE STAINLESS STEEL MOUNTING CHANNEL AND HARDWARE FOR ILLUMINATED EMERGENCY STOP PUSH BUTTON BOX. E-STOP SHALL BE INSTALLED IN A 4"X4" STAINLESS STEEL BOX MOUNTED +/- 3' AFF.
16. PROVIDE (2) #12 + #12G TO MOTOR HEATER TERMINAL BLOCKS IN MOTOR CONNECTION BOX.
17. STAINLESS STEEL NEMA 4X JUNCTION BOX SIZED AS REQUIRED AND MOUNTED ON STAINLESS STEEL CHANNEL. PROVIDE WITH BACK PANEL AND DIN RAIL MOUNTED TERMINALS AS REQUIRED FOR CONNECTION OF ALL CONDUCTORS ENTERING JUNCTION BOX.
18. PROVIDE (1) ¾"C WITH #18 TSP AND (1) ¾"C WITH (2) #14 +#14 GND FROM EXISTING FLOW TRANSMITTER TO SCADA PANEL. COORDINATE POWER CONNECTION IN SCADA PANEL AS REQUIRED. PROVIDE ¾"C FROM TRANSMITTER TO NEW JUNCTION BOX FOR EXISTING INSTRUMENT CABLE. CONNECT JUNCTION BOX TO EXISTING CONDUIT TO FLOW METER.
19. INDICATES (1) ¾"C WITH #18 TSP AND (1) 1-1/2" C WITH C-32+P-2.
20. MOUNT POSITION SWITCH ON ROOF HATCHES LOCATED OVER EACH PUMP MOTOR ASSEMBLY. POSITIONS SHOWN DIAGRAMTICALLY FOR CLARITY, FIELD VERIFY ACTUAL MOUNTING LOCATIONS.

REVISIONS		
1	REVISED AS PER ADDENDUM 1	02/18/15

CITY OF NORFOLK
DEPARTMENT OF UTILITIES

400 GRANBY STREET
NORFOLK, VIRGINIA 23501

LAKE PRINCE RAW WATER PUMPING STATION FLOOD MITIGATION AND MISCELLANEOUS IMPROVEMENTS

KEY PLAN

GRAPHIC SCALES

SIGNATURE

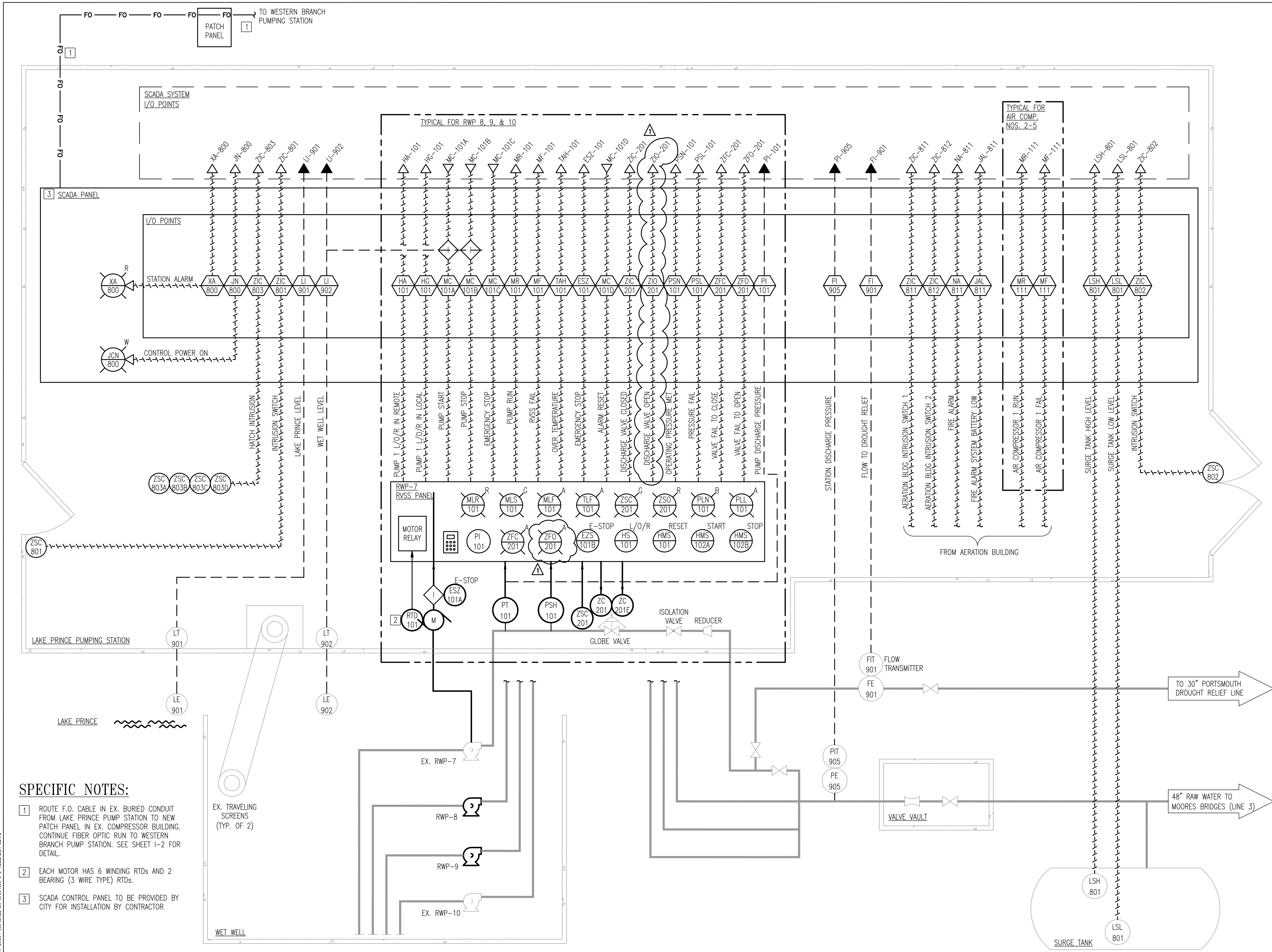
COMMONWEALTH OF VIRGINIA
PADRAIC WILLIAM GRAY
Lic. No. 50246
12/12/2014
PROFESSIONAL ENGINEER

WHITMAN, REQUARDT & ASSOCIATES, LLP
5701 Cleveland Street, Suite 620, Virginia Beach, VA 23462

GRADE LEVEL PLAN - I & C

Drawing No.
I-2

Scale: NOT TO SCALE		
Date: DEC. 12, 2014	Sheet 38 of 44	
Des: JTJ	Drawn: JTJ	Check: PWG



SPECIFIC NOTES:

1. ROUTE F.O. CABLE IN EX. BURIED CONDUIT FROM LAKE PRINCE PUMP STATION TO NEW PATCH PANEL IN EX. COMPRESSOR BUILDING. CONTINUE FIBER OPTIC RUN TO WESTERN BRANCH PUMP STATION. SEE SHEET I-2 FOR DETAIL.
2. EACH MOTOR HAS 6 WINDING RTDs AND 2 BEARING (3 WIRE TYPE) RTDs.
3. SCADA CONTROL PANEL TO BE PROVIDED BY CITY FOR INSTALLATION BY CONTRACTOR

REVISIONS		
1	REVISED AS PER ADDENDUM 1	02/18/15

CITY OF NORFOLK
DEPARTMENT OF UTILITIES

400 GRANBY STREET
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LAKE PRINCE RAW WATER PUMPING STATION FLOOD MITIGATION AND MISCELLANEOUS IMPROVEMENTS

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PROFESSIONAL ENGINEER

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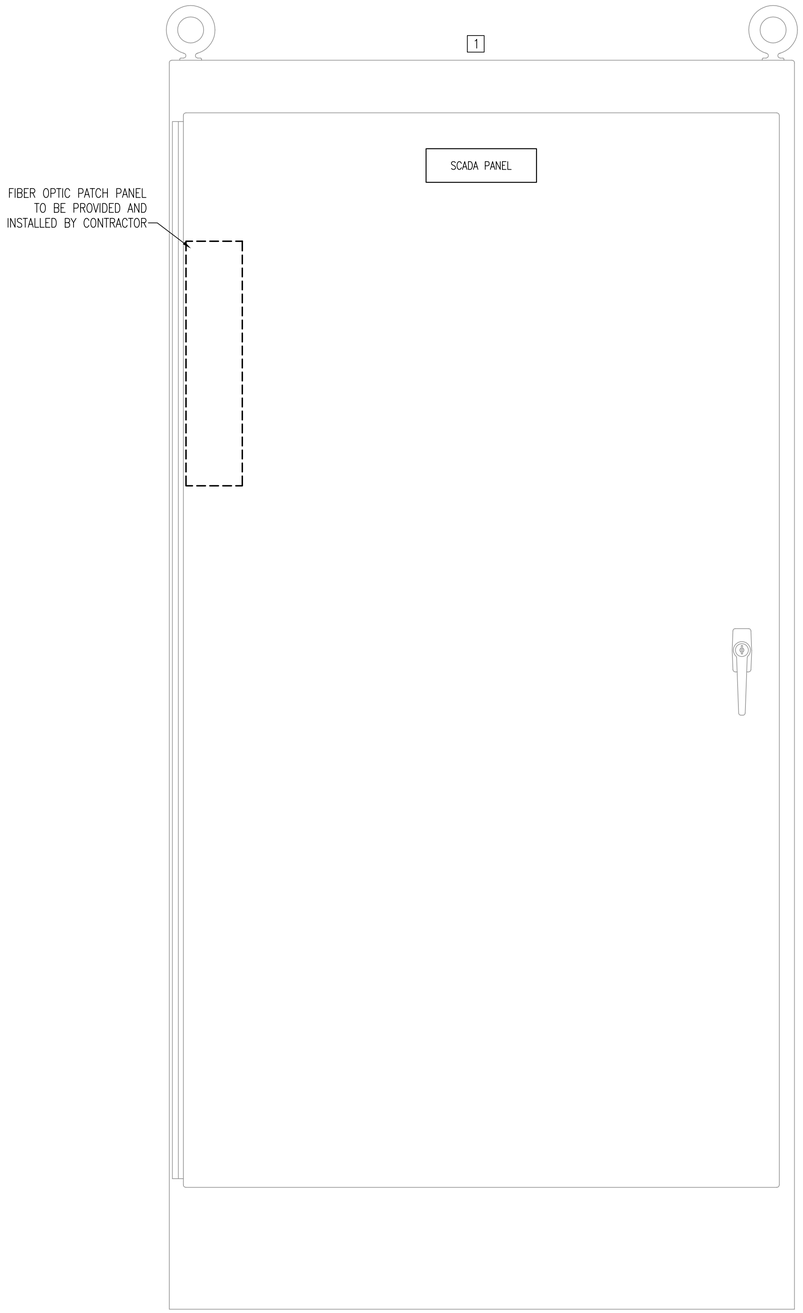
5701 Cleveland Street, Suite 620, Virginia Beach, VA 23462

INSTRUMENTATION AND CONTROLS
P & ID

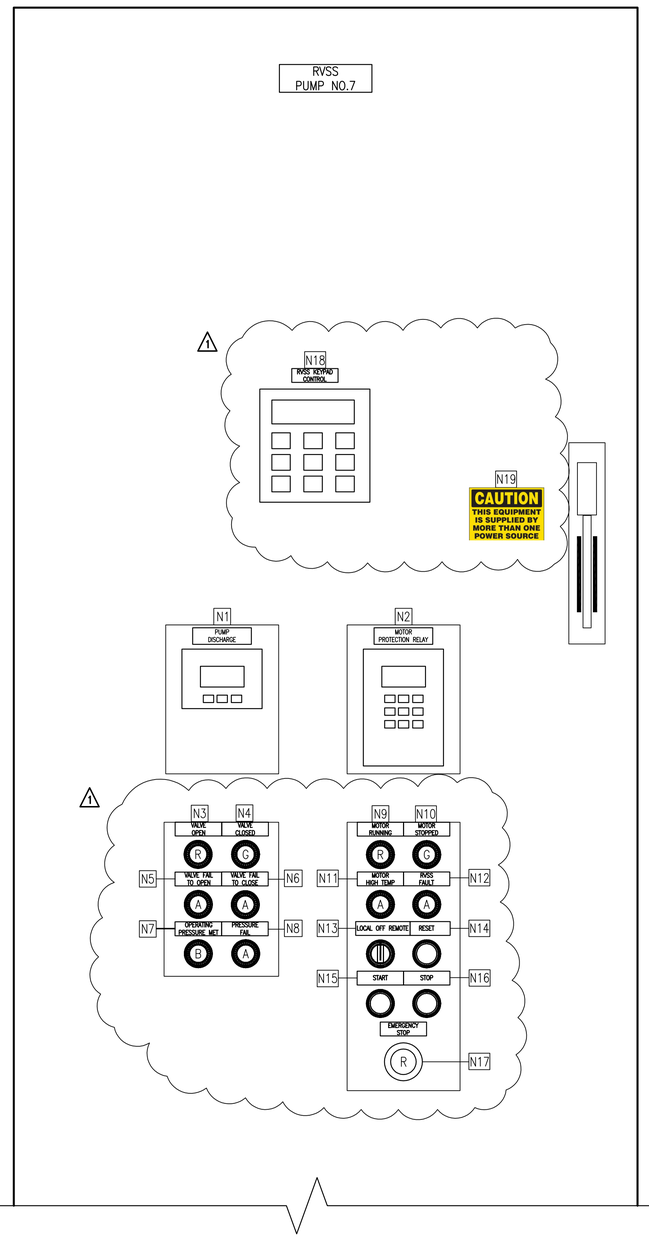
Drawing No.

I–3

Scale: NOT TO SCALE
Date: DEC. 12, 2014 Sheet 39 of 44
Des: JTJ Drawn: JTJ Check: PWG



1 I-4 SCADA PANEL ELEVATION
SCALE: NONE



2 I-4 RVSS PUMP 7
MCC PANEL ELEVATION (PARTIAL)
SCALE: NONE
PANEL SHOWN FOR RWP NO.7,
(TYPICAL FOR RWP NO.8, NO.9, & NO.10)

GENERAL NOTES

1. REFER TO SHEET I-1 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

SPECIFIC NOTES:

1 PANEL TO BE PROVIDED BY THE CITY FOR INSTALLATION BY CONTRACTOR. CONTRACTOR WILL BE REQUIRED TO PICK UP THE SCADA PANEL AT THE CITY'S WESTERN BRANCH PUMP STATION AND TRANSPORT TO SITE. CONTRACTOR TO COORDINATE FINAL PANEL DIMENSIONS WITH CITY DURING CONSTRUCTION.

2 REFER TO ELECTRICAL MCC ELEVATION DRAWINGS FOR DETAIL.

NAME PLATE SCHEDULE

N1	PUMP DISCHARGE
N2	MOTOR PROTECTION RELAY
N3	VALVE OPEN
N4	VALVE CLOSED
N5	VALVE FAIL TO OPEN
N6	VALVE FAIL TO CLOSE
N7	OPERATING PRESSURE MET
N8	PRESSURE FAIL
N9	MOTOR RUNNING
N10	MOTOR STOPPED
N11	MOTOR HIGH TEMP
N12	RVSS FAULT
N13	LOCAL OFF REMOTE
N14	RESET
N15	START
N16	STOP
N17	EMERGENCY STOP (ILLUMINATED)
N18	RVSS KEYPAD CONTROL
N19	CAUTION MORE THAN ONE SOURCE OF POWER

REVISIONS		
1	REVISED AS PER ADDENDUM 1	02/18/15

CITY OF NORFOLK
DEPARTMENT OF UTILITIES

400 GRANBY STREET
NORFOLK, VIRGINIA 23501

LAKE PRINCE RAW WATER PUMPING STATION FLOOD MITIGATION AND MISCELLANEOUS IMPROVEMENTS

KEY PLAN

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PADRAIC WILLIAM GRAY
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12/12/2014
PROFESSIONAL ENGINEER

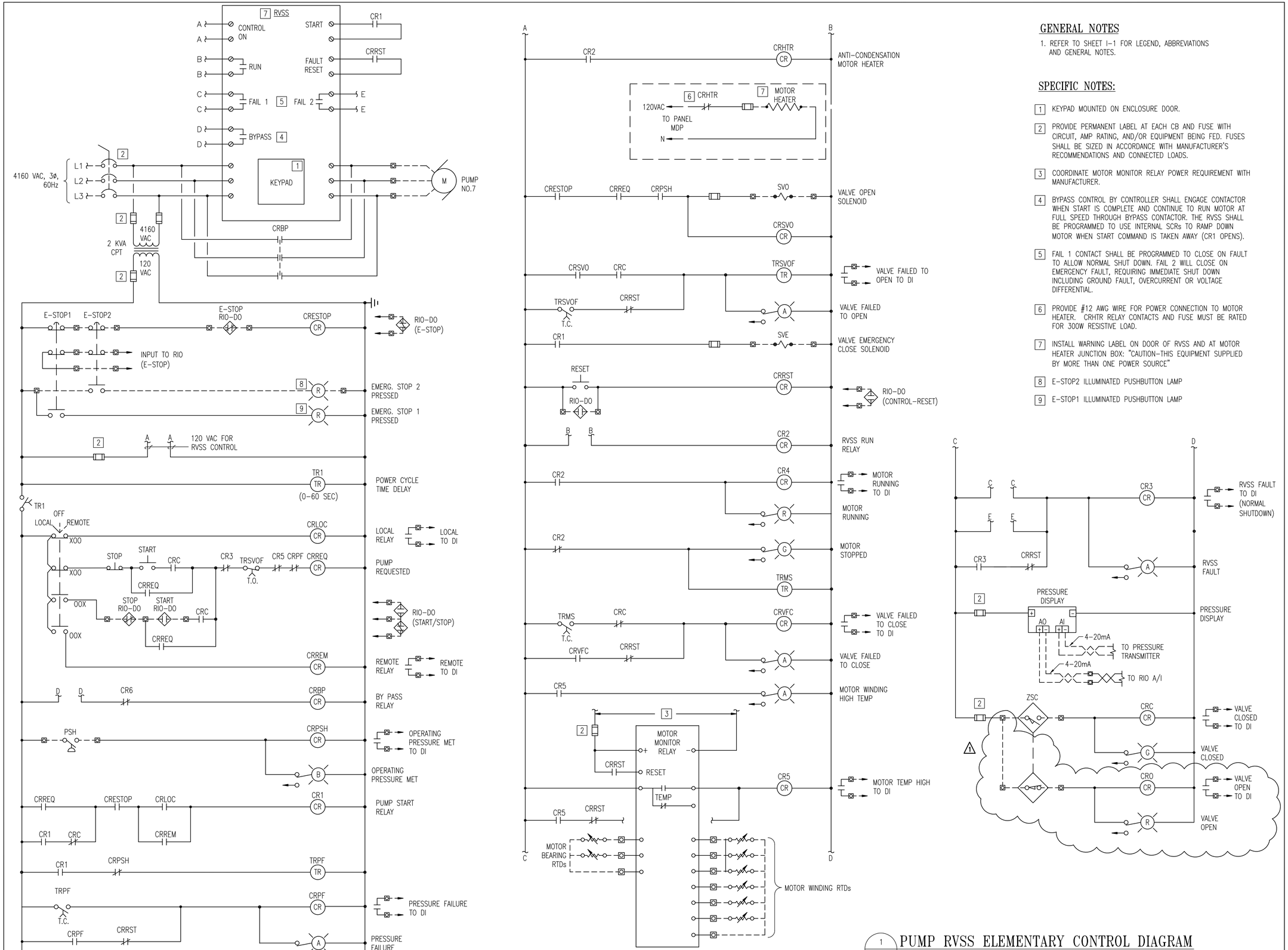
WHITMAN, REQUARDT & ASSOCIATES, LLP
5701 Cleveland Street, Suite 620, Virginia Beach, VA 23462

SCADA AND RVSS MCC PANEL ELEVATION I

Drawing No.

I-4

Scale: NOT TO SCALE		
Date: DEC. 12, 2014	Sheet 40 of 44	
Des: JTJ	Drawn: JTJ	Check: PWG



GENERAL NOTES

1. REFER TO SHEET I-1 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES.

SPECIFIC NOTES:

1. KEYPAD MOUNTED ON ENCLOSURE DOOR.
2. PROVIDE PERMANENT LABEL AT EACH CB AND FUSE WITH CIRCUIT, AMP RATING, AND/OR EQUIPMENT BEING FED. FUSES SHALL BE SIZED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND CONNECTED LOADS.
3. COORDINATE MOTOR MONITOR RELAY POWER REQUIREMENT WITH MANUFACTURER.
4. BYPASS CONTROL BY CONTROLLER SHALL ENGAGE CONTACTOR WHEN START IS COMPLETE AND CONTINUE TO RUN MOTOR AT FULL SPEED THROUGH BYPASS CONTACTOR. THE RVSS SHALL BE PROGRAMMED TO USE INTERNAL SCRs TO RAMP DOWN MOTOR WHEN START COMMAND IS TAKEN AWAY (CR1 OPENS).
5. FAIL 1 CONTACT SHALL BE PROGRAMMED TO CLOSE ON FAULT TO ALLOW NORMAL SHUT DOWN. FAIL 2 WILL CLOSE ON EMERGENCY FAULT, REQUIRING IMMEDIATE SHUT DOWN INCLUDING GROUND FAULT, OVERCURRENT OR VOLTAGE DIFFERENTIAL.
6. PROVIDE #12 AWG WIRE FOR POWER CONNECTION TO MOTOR HEATER. CRHTR RELAY CONTACTS AND FUSE MUST BE RATED FOR 300W RESISTIVE LOAD.
7. INSTALL WARNING LABEL ON DOOR OF RVSS AND AT MOTOR HEATER JUNCTION BOX: "CAUTION-THIS EQUIPMENT SUPPLIED BY MORE THAN ONE POWER SOURCE"
8. E-STOP2 ILLUMINATED PUSHBUTTON LAMP
9. E-STOP1 ILLUMINATED PUSHBUTTON LAMP

1 I-5 PUMP RVSS ELEMENTARY CONTROL DIAGRAM
SCALE: NONE
TYP. FOR RWP-8, RWP-9, AND RWP-10

REVISIONS		
1	REVISED AS PER ADDENDUM 1	02/18/15

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PUMP RVSS ELEMENTARY CONTROL DIAGRAM

Drawing No.
I-5

Scale: NOT TO SCALE			
Date: DEC. 12, 2014		Sheet 41 of 44	
Des: JTJ	Drawn: JTJ		Check: PWG